Five-Year Review Report

for

Ottawa Radiation Areas Site
LaSalle County
City of Ottawa, Illinois

PREPARED BY:

United States Environmental Protection Agency
Region 5
Chicago, Illinois

Approved by:

Richard C. Karl, Director
Superfund Division

11-7-11
Date

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List of Acronyms

ARAR	Applicable or relevant and appropriate requirement
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response Compensation Liability Act
DOE	Department of Energy
EPA	Environmental Protection Agency
ESD	Explanation of Significant Differences
IC	Institutional Controls
IL EPA	Illinois Environmental Protection Agency
IEMA	Illinois Emergency Management Agency
IDNS	Illinois Department of Nuclear Safety
LPI	Luminous Processes, Inc.
MCL	Maximum Contaminant Level
mg/kg	Milligram Per Kilogram
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
pCi/g	Pico Curies per Gram
pCi/L	Pico Curies per Liter
ppb	Parts Per Billion
ppm	Parts Per Million
PRG	Preliminary Remediation Goal
PRP	Potentially Responsible Party
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager

Executive Summary

The Ottawa Radiation Areas Site consists of 16 subareas within and just outside the city limits of Ottawa, LaSalle County, Illinois. The Ottawa Radiation Areas Site became contaminated as a result of activities associated with two radium dial painting companies. On October 14, 1992, the U.S. Environmental Protection Agency added the Ottawa Radiation Areas Site to the National Priorities List (NPL). Of the 16 subareas, the EPA prioritized residential properties and properties near residential areas for removal actions because they posed a greater endangerment to the public. Between 1995 and 1997, the EPA conducted removal activities at 12 of the 16 subareas; the EPA is not conducting a review of the removal subareas because radium-contaminated soil was removed to a cleanup level of 6.2 pico curies per gram (pCi/g) radium-226, which allows unlimited use and unrestricted exposure at these removal properties.

Seven subareas (NPL-1, 4, 8, 9, 11, Illinois Power Building, and Luminous Processes, Inc. Adjacent) were investigated under the remedial program. The decision documents are listed on page 2.

The EPA initiated construction on one of the subareas of Operable Unit #2 on November 9, 2006, thus the EPA is conducting this Five-Year Review (FYR). Construction of the remedies for the Ottawa Radiation Areas Site has not been completed, and the Site has not yet reached construction completion. The status and protectiveness determinations are summarized for each operable unit/subarea of the Site below:

Operable Unit #1 (NPL-8 landfill):

> NPL-8 landfill: The EPA selected the remedy for the NPL-8 landfill in a Record of Decision dated September 8, 2000 (2000 ROD), which includes excavation of soil down to a depth of 10 feet below ground surface (bgs), off-site disposal of soil, backfilling and institutional controls. Institutional controls (ICs) will be needed to prohibit disturbance of the 10 foot soil cover, prohibit construction of buildings with basements, and require a radon reduction system for any buildings (without basements). The remedial actions have not yet begun at the NPL-8 landfill; therefore, this area cannot be evaluated for protectiveness as part of this FYR. A protectiveness determination is therefore not provided for Operable Unit #1 in this FYR.

Operable Unit #2 (NPL-1, 4, 9, 11 and Illinois Power Building):

Overall, the protectiveness determination for Operable Unit #2 cannot be made at this time because the remedies at NPL-1 and NPL-4 have not been completed. A protectiveness determination for Operable Unit #2 will be made once the EPA completes the remedies at NPL-1 and NPL-4 subareas. In the interim, there are currently no known complete exposure pathways and therefore there are no unacceptable risks present at the Operable Unit #2 subareas. Below is a discussion of each of the subareas of Operable Unit #2:

> NPL-1: The EPA selected a remedy for NPL-1 in the 2000 ROD, which requires

excavation and disposal of all contaminated soil above the 6.2 pCi/g radium-226 cleanup standard. The remedy at NPL-1 is expected to be protective of human health and the environment upon completion of the excavation remedy and in the interim, exposure pathways that could result in unacceptable risks are being controlled. Radon sampling of the nearby Marquette High School locker room/storage facility has shown that levels of radon are below the action level of 4.0 pico curies/liter (pCi/l). Additional soil sampling of this area will be conducted.

NPL-4: The EPA selected a remedy for NPL-4 in the 2000 ROD, which requires excavation and disposal of all contaminated soil above the 6.2 pCi/g radium-226 cleanup standard. Remedial actions have not yet begun at NPL-4; therefore, this area cannot be evaluated for protectiveness as part of this FYR.

NPL-9: The EPA selected a remedy for NPL-9 in the 2000 ROD, which requires excavation and disposal of all contaminated soil above the 6.2 pCi/g radium-226 cleanup standard. The remedy at NPL-9 has been implemented and is protective of human health and the environment.

NPL-11: For subarea NPL-11, the remedy is set forth in a 2003 ROD as amended by a ROD Amendment dated August 16, 2010. At NPL-11, the EPA has removed contaminated soil down to an elevation of 491.25 feet. The ROD Amendment addresses contaminated soil below an elevation of 491.25 feet by requiring the implementation of environmental covenants that prohibit: a) excavation below an elevation of 491.25 feet; b) buildings without radon reduction systems; and c) groundwater use. The remedy at NPL-11 is currently protective of human health and the environment because the existing use (empty field) is consistent with the land use restrictions. Long-term protectiveness requires the implementation of an environmental covenant and compliance with land use restrictions at NPL-11.

Illinois Power Building: The EPA selected the remedy for the Illinois Power Building subarea in the 2000 ROD, which includes soil excavation and off-site disposal of soil contaminated with radium-226 above 6.2 pCi/g; backfill of excavated areas with clean material; and, if radon levels persist in the Illinois Power Building, operation of a radon reduction system. The EPA has implemented the remedy at the Illinois Power subarea, and the remedy is protective of human health and the environment because radium-contaminated soil has been excavated to meet the 6.2 pCi/g cleanup level and ICs have been implemented. However, the EPA must verify that the radon reduction system is operational, and that radon testing has been conducted by the property owner.

Operable Unit #3 (Lead-Contaminated Soil Removal Action):

In an Action Memorandum dated September 17, 2001, the EPA selected a response action to remove contaminated soils above lead cleanup levels to a depth not to exceed 4 feet at 613 West Marquette Street and certain other properties. Although the property at 613 West Marquette Street is located within the NPL-9 subarea, soil screening indicated that this address was not contaminated with radium; however, soil contaminated with

lead was found at this property and certain other properties located within NPL-9. After implementation of the removal action, sampling revealed some areas at 613 West Marquette Street exceed industrial/commercial cleanup standards below 4 feet. The former landowners recorded a restrictive covenant that limits the use of the property to industrial/commercial use, prohibits residential use and prohibits disturbance of soil below 4 feet. The remedy at this property is currently protective of human health and the environment because the existing use is consistent with the land use restrictions. Long-term protectiveness requires compliance with institutional controls on the property.

Operable Unit #4 (NPL-8 Frontage Property):

NPL-8 Frontage Property: The EPA selected a remedy for the NPL-8 Frontage Property in the 2003 ROD, which requires excavation of soil down to a depth of 10 feet bgs, off-site disposal of soil, backfilling, and institutional controls. The 2003 ROD requires restrictive covenants to prohibit disturbance of the 10 foot soil cover, prohibit construction of buildings with basements, and require a radon reduction system for any buildings (without basements). The remedial action has not yet begun at NPL-8 Frontage Property; therefore, this area cannot be evaluated for protectiveness as part of this FYR. A protectiveness determination is therefore not provided for Operable Unit #4 in this FYR.

Operable Unit #5 (Luminous Processes, Inc. Adjacent):

Luminous Processes, Inc. (LPI) Adjacent: The EPA selected a remedy for the LPI Adjacent property in an Explanation of Significant Differences (ESD) dated March 21, 2007, which modified the 2003 ROD. The ESD required excavation and off-site disposal of soil contaminated with radium-226 above 6.2 pCi/g at the LPI Adjacent property. EPA has implemented the remedy at LPI Adjacent, which is protective of human health and the environment because radium-contaminated soil has been excavated to meet the 6.2 pCi/g cleanup level.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Ottawa Radiation Areas Site		
EPA ID *(from WasteLAN)*: ILD980606750		
Region: 5	**State:** IL	**City/County:** Ottawa, LaSalle County
SITE STATUS		
NPL status: □ X Final □ Deleted □ Other (specify)		
Remediation status (choose all that apply): X Under Construction □Operating □ Complete		
Multiple OUs?* X YES □ NO	**Construction completion date:** N/A	
Has site been put into reuse? YES NO X		
REVIEW STATUS		
Lead agency: X EPA □ State □ Tribe □ Other Federal Agency		
Author name: Denise Boone		
Author title: Remedial Project Manager	**Author affiliation:** EPA	
Review period: 7/13/2010 to 10/30/2011		
Date(s) of site inspection: 4/8/2011		
Type of review: X Post-SARA □ Pre-SARA □ NPL-Removal only □ Non-NPL Remedial Action Site □ NPL State/Tribe-lead □ Regional Discretion		
Review number: X 1 (first) □ 2 (second) □ 3 (third) □ Other (specify)		
Triggering action: X Actual RA Onsite Construction at OU #_2___ □ Actual RA Start at OU#____ □ Construction Completion Previous Five-Year Review Report □ Other (specify)		
Triggering action date *(from WasteLAN)*: 11/9/2006		
Due date *(five years after triggering action date)*: 11/9/2011		

Five-Year Review Summary Form, cont'd.

Issues:

1. NPL-1: soil contamination may extend under the Marquette High School locker room/storage building.

2. NPL-11: an environmental covenant is not in place on one of the parcels, as required by the ROD Amendment.

3. Illinois Power Building: the radon reduction system may not be operational and radon testing of the building may not have been conducted as required by the restrictive covenant.

4. Overall protectiveness may be improved by registration of areas where radium-226 contaminated soil will remain in place with the state one call program.

Recommendations and Follow-up Actions:

1. NPL-1: investigate soil contamination underneath Marquette High School locker room/storage facility and address if necessary.

2. NPL-11: implement environmental covenant on remaining parcel.

3. Illinois Power Building: verify that the radon reduction system is operational and verify that radon testing has been conducted.

4. Improve long-term stewardship by exploring registering areas where radium-226 contaminated soil will remain in place with state one call program.

Protectiveness Statement(s):

Construction of the remedies for the Ottawa Radiation Areas Site has not been completed, and the Site has not yet reached construction completion. The status and protectiveness determinations are summarized for each operable unit/subarea of the Site below:

Operable Unit #1 (NPL-8 landfill):

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provided for Operable Unit #1 in this FYR.

Operable Unit #2 (NPL-1, 4, 9, 11 and Illinois Power Building):

Overall, the protectiveness determination for Operable Unit #2 cannot be made at this time because the remedies at NPL-1 and NPL-4 have not been completed. A protectiveness determination for Operable Unit #2 will be made once the EPA completes the remedies at NPL-1 and NPL-4 subareas. In the interim, there are currently no known complete exposure pathways and therefore there are no unacceptable risks present at the Operable Unit #2 subareas. Below is a discussion of each of the subareas of Operable Unit #2:

NPL-1: The EPA selected a remedy for NPL-1 in the 2000 ROD, which requires excavation and disposal of all contaminated soil above the 6.2 pCi/g radium-226 cleanup standard. The remedy at NPL-1 is expected to be protective of human health and the environment upon completion of the excavation remedy and in the interim, exposure pathways that could result in unacceptable risks are being controlled. Radon sampling of the nearby Marquette High School locker room/storage facility has shown that levels of radon are below the action level of 4.0 pico curies/liter (pCi/l). Additional soil sampling of this area will be conducted.

NPL-4: The EPA selected a remedy for NPL-4 in the 2000 ROD, which requires excavation and disposal of all contaminated soil above the 6.2 pCi/g radium-226 cleanup standard. Remedial actions have not yet begun at NPL-4; therefore, this area cannot be evaluated for protectiveness as part of this FYR.

NPL-9: The EPA selected a remedy for NPL-9 in the 2000 ROD, which requires excavation and disposal of all contaminated soil above the 6.2 pCi/g radium-226 cleanup standard. The remedy at NPL-9 has been implemented and is protective of human health and the environment.

NPL-11: For subarea NPL-11, the remedy is set forth in a 2003 ROD as amended by a ROD Amendment dated August 16, 2010. At NPL-11, the EPA has removed contaminated soil down to an elevation of 491.25 feet. The ROD Amendment addresses contaminated soil below an elevation of 491.25 feet by requiring the implementation of environmental covenants that prohibit: a) excavation below an elevation of 491.25 feet; b) buildings without radon reduction systems; and c) groundwater use. The remedy at NPL-11 is currently protective of human health and the environment because the existing use (empty field) is consistent with the land use restrictions. Long-term protectiveness requires the implementation of an environmental covenant and compliance with land use restrictions at NPL-11.

Illinois Power Building: The EPA selected the remedy for the Illinois Power Building subarea in the 2000 ROD, which includes soil excavation and off-site disposal of soil contaminated with radium-226 above 6.2 pCi/g; backfill of excavated areas with clean material; and, if radon levels persist in the Illinois Power Building, operation of a radon reduction system. The EPA has implemented the remedy at the Illinois Power subarea,

and the remedy is protective of human health and the environment because radium-contaminated soil has been excavated to meet the 6.2 pCi/g cleanup level and ICs have been implemented. However, the EPA must verify that the radon reduction system is operational, and that radon testing has been conducted by the property owner.

Operable Unit #3 (Lead-Contaminated Soil Removal Action):

In an Action Memorandum dated September 17, 2001, the EPA selected a response action to remove contaminated soils above lead cleanup levels to a depth not to exceed 4 feet at 613 West Marquette Street and certain other properties. Although the property at 613 West Marquette Street is located within the NPL-9 subarea, soil screening indicated that this address was not contaminated with radium; however, soil contaminated with lead was found at this property and certain other properties located within NPL-9. After implementation of the removal action, sampling revealed some areas at 613 West Marquette Street exceed industrial/commercial cleanup standards below 4 feet. The former landowners recorded a restrictive covenant that limits the use of the property to industrial/commercial use, prohibits residential use and prohibits disturbance of soil below 4 feet. The remedy at this property is currently protective of human health and the environment because the existing use is consistent with the land use restrictions. Long-term protectiveness requires compliance with institutional controls on the property.

Operable Unit #4 (NPL-8 Frontage Property):

NPL-8 Frontage Property: The EPA selected a remedy for the NPL-8 Frontage Property in the 2003 ROD, which requires excavation of soil down to a depth of 10 feet bgs, off-site disposal of soil, backfilling, and institutional controls. The 2003 ROD requires restrictive covenants to prohibit disturbance of the 10 foot soil cover, prohibit construction of buildings with basements, and require a radon reduction system for any buildings (without basements). The remedial action has not yet begun at NPL-8 Frontage Property; therefore, this area cannot be evaluated for protectiveness as part of this FYR. A protectiveness determination is therefore not provided for Operable Unit #4 in this FYR.

Operable Unit #5 (Luminous Processes, Inc. Adjacent):

Luminous Processes, Inc. (LPI) Adjacent: The EPA selected a remedy for the LPI Adjacent property in an Explanation of Significant Differences (ESD) dated March 21, 2007, which modified the 2003 ROD. The ESD required excavation and off-site disposal of soil contaminated with radium-226 above 6.2 pCi/g at the LPI Adjacent property. EPA has implemented the remedy at LPI Adjacent, which is protective of human health and the environment because radium-contaminated soil has been excavated to meet the 6.2 pCi/g cleanup level.

Other Comments:

None

Ottawa Radiation Areas Site
Ottawa, Illinois
Five-Year Review Report

I. Introduction

The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review Reports. In addition, Five-Year Review Reports identify issues found during the review, if any, and recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA § 121 and the National Contingency Plan (NCP). CERCLA § 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR § 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The U.S. Environmental Protection Agency Region 5 has conducted a five-year review of the remedial actions implemented at the Ottawa Radiation Areas Site, located in City of Ottawa, LaSalle County, Illinois. This review was conducted by the Remedial Project Manager (RPM) from July 13, 2010 to October 30, 2011. This report documents the results of the review.

This is the first five-year review for the site. The triggering action for this statutory review is the date of the start of construction at OU#2 as shown in the EPA's WasteLAN database: November 9, 2006. This review is required because certain response actions are ongoing and hazardous substances, pollutants, or contaminants are or will be left on site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Site Events	
Event	**Date**
IDNS demolished the LPI building and disposed of contaminated materials in licensed facility	1985 - 1985
DOE aerial radiological survey identifies areas of elevated radiation emissions	May 1986
IDNS conducts ground level radiological survey of properties and begins radon monitoring program	July 1986
EPA performs street by street radiological surveys	December 1987
EPA proposed Ottawa Radiation Areas to the NPL	July 29, 1991
EPA added Ottawa Radiation Areas to the NPL	October 14, 1992
EPA conducted removal activities at 12 subareas	1995 and 1997
Remedial Investigations began	1996
EPA discovered the Illinois Power Building subarea during the initial Superfund removal actions	1996
EPA signed ROD for NPL-1, 4, 8, 9, and Illinois Power Building.	September 8, 2000
Lead-contaminated soil removal from scattered locations at NPL-1 and NPL-9 areas. Homes near NPL-4 hooked up to City of Ottawa municipal water	2002
EPA signed ROD for NPL-11 and NPL-8 Frontage Property	September 24, 2003
The LPI Adjacent Area was identified by the City of Ottawa and EPA conducted an investigation	March 2006
RA NPL-1, 9, 11, and Illinois Power Building	2006-2007
ESD for the LPI Adjacent Area issued	March 21, 2007

Table 1: Chronology of Site Events	
Event	**Date**
RA Luminous Processes, Inc. Adjacent Area	2009
Consent Decree with City of Ottawa	May 2010
ROD Amendment NPL-11	August 16, 2010

III. Background

Physical Characteristics

The Ottawa Radiation Areas Site consists of 16 subareas (Figure 1) within and just outside the city limits of Ottawa, LaSalle County, Illinois. The 16 subareas are NPL-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, Illinois Power Building, and Luminous Processes, Inc. Adjacent. Of the 16 subareas, the EPA prioritized residential properties and properties near residential areas for removal actions because they posed a greater endangerment to the public. Between 1995 and 1997, the EPA conducted removal activities on 12 of the 16 subareas. The EPA is not conducting a review of the removal subareas because radium contaminated soil was removed to a cleanup level of 6.2 pico curies per gram (pCi/g) radium-226, which allows unlimited use and unrestricted exposure at these removal properties.

The EPA is conducting a Five-Year Review (FYR) of the following seven subareas, which were investigated under the remedial program:

NPL-1 is an area of approximately 5 acres within the Ottawa city limits, (see Figure 2). It consists of several parcels of land located at the intersection of Lafayette and Guion Streets. To the north, the site is bordered by several residences located on Lafayette Street; to the west, by residences located on Post Street and property owned by the YMCA; to the south, by the Fox River and "River Walk" walking path; and to the east, by the Marquette High School Athletic Field.

NPL-4 is 4.3 acres in area, on Canal Road approximately one quarter mile east of the Ottawa city limits, (see Figure 3). It consists of two parcels of land, one owned by the Illinois Department of Emergency Management (IEMA) and one privately owned. Canal Road and the Illinois & Michigan (I&M) Canal Walking Path border the site to the north, a residence borders the site to the east, and vacant properties border the site to the south and west.

NPL-8 consists of two properties, the landfill and the Frontage Property, (see Figure 4). The properties are located outside the Ottawa city limits. The landfill is approximately 17 acres and is owned by the State of Illinois. The Frontage Property is 4 acres and is privately owned. The site is bordered to the south and east by car dealerships, and to the north and west by the Fox River and water-filled clay pits. The State plans to develop the landfill into

a State Park. The Frontage Property is currently being used for commercial purposes by an excavating company.

NPL-9 consists of two parcels of land, totaling approximately 1.9 acres in area, within the Ottawa city limits, (see Figure 5). One parcel (NPL-9A), at the northwest corner of the intersection of Marquette and Chestnut Streets is privately owned. This parcel is bordered on the east and south by Chestnut Streets, respectively, to the west by a couple of residences, and to the north by railroad tracks. The second parcel (NPL-9B) is a much smaller piece approximately 500 feet south of the large parcel, just west of Chestnut Street, on the I&M Canal Bike Path, and is owned by the Illinois Department of Natural Resources (IDNR).

NPL-11 is approximately 2 acres and consists of two empty lots within the Ottawa city limits, (see Figure 6). The site is bordered by residences to the north, Goose Creek to the south, and residences to the east and west.

The Illinois Power Building site is a 1.5 acre property within the Ottawa city limits, (see Figure 7). The site is at the corner of Jefferson and Fulton Streets in the central business district. The site is bordered by Jefferson Street to the south, Canal Street and a city parking lot to the west, Jackson Street to the north, and Fulton Street to the east.

The Luminous Processes, Inc. Adjacent Area is approximately 0.4-acre and is located within the city limits of Ottawa, (see Figure 8). The subarea is currently being used as a gravel parking lot for the City of Ottawa. The subarea is adjacent to the former Luminous Processes, Inc. property (currently a City of Ottawa asphalt parking lot).

The City of Ottawa lies in the Illinois Valley. Regionally, the geology of the Ottawa area is primarily composed of bottomland or Wisconsinan glacial deposits, overlying Pennsylvanian-or Ordivician-aged bedrock. The glacial deposits vary from 10 to 100 feet thick in the area. Most of the area is underlain by the Ordivician-aged St. Peter Sandstone, which varies in thickness between 150 to 175 feet. Below the St. Peter Sandstone are shales and sandstones of the Cambrian System, including the 160 to 200 feet thick Galesville Sandstone.

The City of Ottawa municipal drinking water is supplied to city residents from four large volume wells. All of the municipal wells are screened between 1,180 and 1,220 feet below ground surface (bgs) within the Galesville Sandstone, and are located within the northeast quadrant of the City. Saline groundwater was encountered at a depth of 1,500 feet bgs during installation of the municipal wells. The concentration of radium in groundwater, in Ottawa and regionally, is historically high due to elevated levels of naturally-occurring radium from the radioactive decay of thorium in both the Galesville and St. Peter Sandstone aquifers. The Galesville and St. Peter Sandstone aquifers are not hydraulically connected. In the City of Ottawa, the water supply wells radium concentrations range from 3.8 to 12.4 pico curies per liter (pCi/L). This concentration exceeds the Federal Maximum Contaminant Level (MCL) and Illinois Environmental Protection Agency (IL EPA) Groundwater Quality Standards for Class I Groundwater of 5 pCi/L.

Land and Resource Use

NPL-1

Residential and commercial areas surround NPL-1. However, NPL-1 is not being used for either purpose and is an open space area. The property is privately owned and has the potential to be developed as residential or commercial properties. The City of Ottawa has constructed a walking path along the edge of the Fox River. The Marquette High School athletic field is located in the area of NPL-1.

NPL-4

It consists of two parcels of land, one owned by IEMA and one privately owned. The parcel that was purchased by IEMA was originally a residential property. A home built on the property had potentially dangerous levels of radon from the radium contamination on the property and the residents were requested to vacate the home. The homeowners refused to move and eventually the IEMA purchased the property from them. The house was demolished and IEMA's intent is to return the property to residential or commercial use after the site is remediated. The second parcel was used as a commercial establishment when the EPA investigated the property but now the property is being used to store used cars. Other properties surrounding NPL-4 are a mixture of residential and commercial properties. Both properties have the potential to be developed in the future for residential or commercial use.

NPL-8

NPL-8 consists of two properties, the landfill and the Frontage Property. The State of Illinois is the owner of the NPL-8 landfill property. The Illinois Department of Natural Resources (IDNR) has future plans for the property as a state park, which includes a canoe trail along the Fox River, along with ancillary structures (i.e. campgrounds, picnic facilities, showers, and toilets), and eventually, depending on the amount of use, staff residences. The City of Ottawa would like to construct a walking path along the river in the future. The Frontage Property is privately owned and is currently being used for commercial purposes.

NPL-9

NPL-9 consists of two parcels of land. NPL-9A originally was a commercial property but is currently vacant. The site contained two warehouses, which the EPA tore down as part of the removal action to excavate contaminated soils under the buildings. Other commercial properties, a train track, and residential properties surround NPL-9A. NPL-9A has the potential to be developed as a residential or commercial property in the future. NPL-9B is along the I&M Canal Bike Path, which is owned by the IDNR and the land use is not expected to change in the future.

NPL-11

The NPL-11 site is located in the northeast portion of Ottawa. NPL-11 is currently an empty lot, however residential properties constitute the primary land use in the vicinity of this subarea and

it is expected to remain that way in the future.

Illinois Power Building

The Illinois Power Building subarea currently contains a commercial building. The property will most likely remain commercial.

The Luminous Processes, Inc. Adjacent

The subarea is currently in use as a gravel parking lot for the City of Ottawa. The subarea is adjacent to the former Luminous Processes Inc. property (currently a City of Ottawa asphalt parking lot). The Luminous Processes Inc. building was demolished in 1985 by the IEMA (formerly known as the Illinois Department of Nuclear Safety). The subarea is located in an urban environment, generally consisting of light industrial, retail, and residential properties which include a housing authority retirement home and parkland.

History of Contamination

The EPA and the State of Illinois discovered 16 subareas in and around the City of Ottawa with radioactive contamination and subsequently targeted them for cleanup. On July 29, 1991, the EPA added the Ottawa Radiation Areas Site to the National Priorities List (NPL).

The Ottawa Radiation Areas Site became contaminated as a result of activities associated with two radium dial painting companies: the Radium Dial Company, which operated in the City of Ottawa from 1920 through 1932 and the Luminous Processes, Inc. (LPI), which operated in the City of Ottawa from 1932 to 1978. The source of contamination was radium sulfate paint that Radium Dial and LPI used in their dial painting operations. During the course of operations, the companies' equipment, material, buildings, and surrounding work areas became contaminated with radium-226, the major isotope of radium sulfate. Waste from these companies was likely disposed of at NPL-8 and may have been used as fill material within the community. Debris from the demolition of the Radium Dial facility, which occurred in 1968, was probably also buried at one or more locations in the area. The IEMA (formerly known as the Illinois Department of Nuclear Safety) demolished the LPI building in 1985, and contaminated debris from this demolition was disposed of at a licensed radioactive disposal facility.

Initial Response

Of the 16 subareas, the EPA prioritized residential properties and properties near residential areas for removal actions because they posed a greater endangerment to the public. Between 1995 and 1997, the EPA conducted removal activities on 12 of the 16 sites. Removals were conducted at NPL-1, 2, 3, 5, 6, 7, 9, 10, 11, 12, 13, and 14. The removal cleanup level for radium-226 was established as 5 pCi/g above the background level for the Ottawa area. Since background was determined to be 1.2 pCi/g, the ultimate cleanup level for removal actions was determined to be 6.2 pCi/g in soil. Approximately 32,000 cubic yards of radioactive soils and debris were removed. However, the EPA did not complete these removals at NPL-1, 9, and 11 because of: (a) the pervasiveness of the land filled wastes; (b) the total cost, approximately $35

million; and (c) the amount of time needed to complete the removal action far exceeded the limits of the Superfund Removal Program. At NPL-1, a total of 12,040 tons or approximately 9,000 cubic yards of radium-contaminated soil was removed. At NPL-9, a total of 5,766 tons or approximately 4,300 cubic yards of radium-contaminated soil was removed. At NPL-11, a total of 4,176 tons of radium-contaminated soil was removed. The EPA further investigated the areas where cleanup activities were not completed (NPL-1, 9, and 11), as well as other areas (NPL-4, NPL-8, Illinois Power Building, and Luminous Processes, Inc. Adjacent) under the Superfund Remedial Program.

In 2002, the EPA removed lead-contaminated soil from scattered locations at NPL-1 and NPL-9 areas. At NPL-1, a total of 400 cubic yards of soil were removed from four residential locations. In the industrial area of NPL-9, approximately 5,000 cubic yards of lead-contaminated soil were removed. Six residential properties in the area of NPL-4 were connected to the City of Ottawa's municipal water supply due to beryllium in the residential wells.

Basis for Taking Action

Summary of Site Characteristics

Hazardous substances that have been released at the subarea in soil include:

NPL-1, 4, 9, 11, Illinois Power Building, and Luminous Processes, Inc. Adjacent:

Soil
Radium-226 (includes radon-222 decay by-products)

NPL-8:

Soil
Radium-226 (includes radon-222 decay by-products)
Benzo(a)anthracene
Benzo(a)flouranthene
Benzo(a)pyrene
Indeno(1,2,3-cd)pyrene
Dibenzo(a,h)anthracene
Antimony
Arsenic
Beryllium
Iron
Lead
Manganese

Exposures to soil are associated with significant human health risks, due to exeedance of the EPA's risk management criteria for either the average or the reasonable maximum exposure scenarios. The carcinogenic risks were exceeded for exposure to radium-226 at the subareas in soil. At NPL-8 landfill property, the carcinogenic risks and non-carcinogenic risks were

exceeded for exposure to polycyclic aromatic hydrocarbons and metals in soil. For these NPL subareas, exposures to radon gas via inhalation also constituted an unacceptable risk. Since the EPA found that groundwater was not significantly impacted at any of the sites, there are no specific remedial components for groundwater contamination. However, contaminated perched water was discovered at some of the sites and as part of excavation activities perched water may be encountered, particularly for the complete excavations alternatives proposed for NPL-4 and NPL-8. The ecological risk assessment did not find adverse effects to environmental receptors, terrestrial plants, or aquatic invertebrates. However, additional non-radiation data was collected at NPL-1 and NPL-9 resulting in the lead-contaminated soil removal.

IV. Remedial Actions

Remedy Selection

The Ottawa Radiation Areas are divided up into the following operable units:

Operable Unit #1 (NPL-8 landfill)
Operable Unit #2 (NPL-1, 4, 9, 11, and Illinois Power Building)
Operable Unit #3 (Lead-Contaminated Soil Removal)
Operable Unit #4 (NPL-8 Frontage Property)
Operable Unit #5 (Luminous Processes, Inc. Adjacent)

The following decision documents have been issued for the Site:

NPL-1, 4, 9: ROD dated September 8, 2000
NPL-8 landfill: ROD dated September 8, 2000
NPL-8 Frontage Property: ROD dated September 24, 2003
NPL-11: 2003 ROD was amended by ROD Amendment dated August 16, 2010
Illinois Power Building: ROD dated September 8, 2000
Luminous Processes, Inc. Adjacent: ESD dated March 21, 2007 modified September 24, 2003 ROD

The following remedial action objectives (RAOs) have been identified for the site:

- Prevent ingestion and inhalation of external exposure to surface and subsurface soil contaminated with radium-226 exceeding a cleanup level of 6.2 pCi/g.
- Prevent lateral migration of radium-226 in groundwater and prevent exposure of wildlife to contaminated soil.
- Prevent downward migration of contaminates of concern in soil to perched groundwater and groundwater via percolation.

The major components of the selected remedies include:

NPL-1

- Excavate soil contaminated with radium-226 above 6.2 pCi/g and, if necessary, soils

contaminated with organic and/or inorganic chemicals;
- Backfill excavated areas with clean material;
- Dispose of the excavated contaminated material at a licensed radioactive material or off-site landfill in accordance with applicable federal and/or state regulations; and
- Collect perched water during excavation with treatment, if necessary, and discharge to the City of Ottawa's wastewater treatment system.

It is anticipated that the selected remedy will allow unlimited use or unrestricted exposure (UU/UE) at the NPL-1.

NPL-4

- Excavate soil contaminated with radium-226 above 6.2 pCi/g and, if necessary, soils contaminated with organic and/or inorganic chemicals;
- Backfill excavated areas with clean material;
- Process excavated soil to: (a) separate out the contaminated portion; and (b) reduce, to the extent practical, the volume of contaminated soil disposed off-site. This may be done using a segmented gate system, if that system is determined to be effective through pilot testing. If the pilot testing demonstrates that the segmented gate is not effective or will not result in cost savings, then the material may be manually separated instead to achieve volume reduction;
- Dispose of the excavated contaminated material at a licensed radioactive material or off-site landfill in accordance with applicable federal and/or state regulations; and
- Collect perched water during excavation with treatment, if necessary, and discharge to the City of Ottawa's wastewater treatment system.

It is anticipated that the selected remedy will allow NPL-4 to support UU/UE.

NPL-8 (landfill and Frontage Property)

- Excavate soil contaminated with radium-226, above 6.2 pCi/g, down to a depth of 10 feet bgs;
- Backfill excavated areas with clean material;
- Process excavated soil to: (a) separate out the contaminated portion; and (b) reduce, to the extent practical, the volume of contaminated soil disposed off-site. This may be done using a segmented gate system, if that system is determined to be effective through pilot testing. If the pilot testing demonstrates that the segmented gate is not effective or will not result in cost savings, then the material may be manually separated instead to achieve volume reduction;
- Dispose of the excavated contaminated material at an off-site, licensed radioactive material landfill;
- Potential erosion measures for Fox River banks; and
- Institutional controls (ICs) that restrict siting of buildings and excavation below 10 feet in soil.

The selected remedy for NPL-8 will not support UU/UE.

NPL-9

- Excavate soil contaminated with radium-226 above 6.2 pCi/g and, if necessary, soils contaminated with organic and/or inorganic chemicals;
- Backfill excavated areas with clean material; and
- Dispose of the excavated contaminated material at a licensed radioactive material or off-site landfill in accordance with applicable federal and/or state regulations.

The EPA has implemented the selected remedy, which allows UU/UE at NPL-9.

NPL-11

As part of the 1996 removal action, the EPA excavated soil contaminated with radium-226 down to an elevation of 491.25 feet, disposed of the contaminated material at a licensed radioactive material landfill, and placed five to six feet of clean backfill over the remaining contamination at NPL-11. Although the 2003 ROD for NPL-11 selected excavation of all soil contaminated with radium-226 above 6.2 pCi/g, the EPA's subsequent investigation determined that it was technically impracticable to meet the 6.2 pCi/g cleanup level below an elevation of 491.25 feet on two parcels of NPL-11. The EPA subsequently signed a ROD Amendment on August 16, 2010, which selected environmental covenants to implement the following land use restrictions:

- Prohibit excavation of soil at the site below an elevation of 491.25 feet in the area demarcated as the extent of contamination, unless conducted pursuant to an EPA- or Illinois EMA-approved work plan;
- Prohibit construction of any building in the area demarcated as the extent of contamination, unless a radon reduction system is operating and maintained to ensure that levels of radon in such buildings do not exceed 0.02 working level. Further, only slab-type buildings would be allowed;
- Require that material excavated from any portion of the site be tested and disposed of in accordance with applicable regulations; and
- Prohibit use of groundwater at the NPL-11 Site.

The selected remedy for NPL-11will not support UU/UE.

Illinois Power Building Soil

The EPA excavated and disposed of soil contaminated with radium-226 off-site at a licensed radioactive material landfill. A restrictive covenant has been implemented, which requires the owners to conduct radon monitoring in the Illinois Power Building, which lies adjacent to the excavated area, to determine if radon levels exceed permissible levels. If radon levels persist then a radon reduction system will be operated in the building and additional testing may be needed.

The EPA has implemented the selected remedy, which does not support UU/UE.

The Luminous Processes, Inc. Adjacent

- Excavate soil contaminated with radium-226 above 6.2 pCi/g;
- Backfill excavated areas with clean material;
- Dispose of the excavated contaminated material at a licensed radioactive material or off-site landfill in accordance with applicable federal and/or state regulations;
- Collect perched water (if necessary), treat and discharge to surface water or discharge to the City of Ottawa's wastewater treatment system; and
- Option of volume reduction - Process excavated soil to (a) separate out the contaminated portion; (b) reduce, to extent practical, the volume of contaminated soil to be disposed of off-site. This may be done using mechanical screening and/or Segmented Gate System if that system is determined to be effective for the volume of soil to be excavated.

The EPA has implemented the selected remedy, which allows UU/UE at the Luminous Processes, Inc. Adjacent property.

Remedy Implementation

Treatability Study

In 2003, the EPA conducted a Treatability Study at NPL-4 and NPL-8. The Treatability Study examined the ability of the Segmented Gate System (SGS) to sort soils at a level of 6.2 pCi/g. The SGS was not effective in sorting soil; therefore, it will not be used for the remediation. Consequently, the soil will be manually sorted during the excavation process.

NPL-1, 9, 11, and Illinois Power Building

In 2006 through 2007, the EPA initiated the remedial action at NPL-1, 9, 11, and Illinois Power Building subareas. The radium-contaminated soil from NPL-1, 9, and Illinois Power Building subareas was disposed of at a licensed radioactive material facility in Clive, Utah.

NPL-1

EPA excavated 6,502 tons of radium-contaminated soil to a depth of 15.6 feet bgs at the NPL-1 subarea. All of the contamination was removed to meet the 6.2 pCi/g cleanup level except for one area in the northwest corner where the contamination extends under Guion Street. Perched groundwater was treated and discharged to the Fox River. Soil samples collected during the cleanup confirm that contamination was underneath Guion Street. Radium contamination under Guion Street ranged from 0.24 to 176 pCi/g at a depth 9 to 10 feet with an estimated volume of 636 cubic yards. Pursuant to Consent Decree (1:10-cv-01887) with the United States, the City of Ottawa has agreed to prohibit interference with the asphalt road and excavation of soils under the road unless the action is taken pursuant to a work plan approved by the EPA.

The NPL-1 excavation areas expanded beyond the EPA's estimation. Consequently, due to time and budgetary constraints, the EPA did not complete the entire cleanup. A supplemental remedial investigation conducted at NPL-1 in 2009, found radium-226 contamination from a

depth of 4 to 16 feet at a concentration of 6.96 to 194 pCi/g, and estimated volume of 385 cubic yards. Contamination may be under the Marquette High School Athletic Field locker room/storage building; therefore, a further soil investigation is needed. Radon testing results of the locker room/storage building were below the recommended action level of 4.0 pCi/L.

NPL-9

The EPA excavated soil to a depth of 11 feet bgs at NPL-9A. A total of 640.46 tons of radium-contaminated waste was excavated from the NPL-9A subarea. At NPL-9B, soil excavated ranged in depth from 7 feet near the tow path to 4 feet near the railroad tracks. A total of 204.37 tons of radium-contaminated waste was excavated from the NPL-9B subarea. Confirmation samples confirmed that the 6.2 pCi/g cleanup level was met. Perched groundwater was treated and discharged to the City of Ottawa sewer.

Illinois Power Building

At the Illinois Power Building, the EPA excavated a total of 23.31 tons of radium-contaminated soil. The EPA excavated soil in the western area to a depth of 18 inches and in the southern area (located between the former Illinois Power Building and Jefferson Street) to approximately one-foot depth. Confirmation samples confirmed that the 6.2 pCi/g cleanup level was met. The soil beneath the building was never evaluated for safety reasons.

IEMA collected radon measurements in all occupied areas of the building to characterize radon levels. Data were recorded over one weekend, from August 10, 2007 to August 13, 2007, using activated charcoal detectors and continuous radon monitors. IEMA's Radon Measurement and Characterization Report indicated the average radon concentration for both the charcoal detectors and continuous radon monitors was below the recommended action level of 4.0 pCi/L. However, the continuous radon monitor results indicated periods where the radon concentration was above the action level. IEMA recommended that indoor radon mitigation systems be returned to full operability.

Since the soil beneath the building was never evaluated, a Declaration of Environmental Restrictive Covenant was recorded by the LaSalle County Recorder on September 9, 2008. The restrictive covenant included the following restrictions:

> No excavation under buildings: The extent of contamination, if any, associated with the soils underneath the foundations of the buildings has not been determined. No action shall be taken to drill or intrude into, or demolish the building foundations and no action shall be taken to excavate soils under the buildings unless the owner conducts an extent of contamination study and removes all soils that exceed 6.2 pCi/g radium- 226 pursuant to an IEMA approved work plan on the property.
>
> Radon Mitigation System: The owner must operate and maintain a radon mitigation system in any buildings on the property to ensure that levels of radon do not exceed 4 pCi/L or other radon level the EPA determines is necessary to protect human health or the environment. The owner must conduct radon testing at the building at least every two

years by an IEMA licensed measurement professional to ensure the mitigation system is working properly.

The Luminous Processes, Inc. Adjacent

The remedy was implemented in 2009. A total of 411 tons of radium-contaminated material was excavated to the lowest depth of 5 feet. Confirmation samples confirmed that the 6.2 pCi/g cleanup level was met. No perched groundwater was encountered. The material was shipped to a licensed facility in Grand View, Idaho.

NPL-11

The EPA amended the 2003 ROD by a ROD Amendment for NPL-11, which was signed on August 16, 2010. As part of the 1996 removal action, the EPA excavated soil contaminated with radium-226 down to an elevation of 491.25 feet and disposed of the contaminated material at a licensed radioactive material landfill. Five to six feet of clean backfill was placed over the remaining contamination.

The 2010 ROD Amendment was based on sampling data collected during the 2006 through 2007 remedial action at NPL-1, 9, 11, and Illinois Power Building subareas. In the 2010 ROD Amendment, it was determined that the complete excavation of the remaining radium-contaminated material was technically impracticable. The 2010 ROD Amendment selected environmental covenants to address the remaining radium-226 contamination below 491.25 feet. The owner of one parcel has implemented an environmental covenant to implement the required land use restrictions.

The owners of the other NPL-11 lot have signed an Administrative Order by Consent (VW-91-C-081 dated December 31, 1990) whereby they agreed to prohibit residential and commercial construction on the parcel. The EPA is conducting an investigation of groundwater to determine the extent of contamination.

NPL-4 and NPL-8

The EPA has not yet implemented the remedies at NPL-4 and NPL-8 subareas. The timing for implementation of these remedies is dependent on the availability of funding.

System Operation and Maintenance (O&M)

There is no O & M planned for NPL-4, 9, or Luminous Processes, Inc. Adjacent. O & M, such as compliance monitoring of land use restrictions, is required at NPL-1 Guion Street, NPL-11, and Illinois Power where subsurface radium contaminated material will remain in place. At NPL-8 (landfill and Frontage Property), following the completion of the remedial action, the post-closure monitoring and maintenance period (O&M) would begin. The O&M activities would include annual groundwater monitoring and annual maintenance of the 10 foot backfill layer to preserve its integrity as a cover.

Institutional Controls (ICs)

Institutional controls (ICs) are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Compliance with ICs is required to assure long-term protectiveness for any areas which do not allow for unlimited use and unrestricted exposure (UU/UE).

The table below identifies those areas that do not support UU/UE and the institutional controls for these restricted areas at the site.

Institutional Controls Summary Table

Subarea	Media, Engineered Controls, & Areas that Do Not Support UU/UE	IC Objective	Title of Institutional Control Instrument
NPL-1 Guion Street	Radium-226 remains at 9-10 feet bgs under road at Guion Street.	Prohibit interference with asphalt road or excavation of soils under road unless action is taken pursuant to a work plan approved by EPA.	Consent Decree: 1:10-cv-01887 between City of Ottawa and United States - implemented May 17, 2010.
NPL-8 landfill and Frontage Property	The remedy has not yet been initiated. After remedy construction is completed, radium-226 will remain below 10 feet bgs.	Prohibit disturbance of the soil cover, construction of buildings with basements, and radon reduction system for any building with basements.	Environmental Covenant planned following completion of construction.
NPL-9	Soil contaminated with lead remains below 4 feet bgs at 613 W. Marquette.	Prohibit residential use and disturbance of soil below 4 feet.	Warranty Deed with reservation of environmental easement and declaration of restrictive covenants recorded with the LaSalle County (document no. R2004-6385) March 16, 2004.

NPL-11	Radium-226 contaminated soil remains below an elevation of 491.25 feet in certain areas of 351 and 353 Bellevue Avenue (see Figure 9).	Prohibit excavation of soil at the site below an elevation of 491.25 feet in certain areas unless conducted pursuant to an EPA- or Illinois EMA-approved work plan. Test and dispose of material excavated from any portion of the site in accordance with applicable regulations. Prohibit construction of any building, unless a radon reduction system is operating and maintained to ensure that levels of radon in such buildings do not exceed 0.02 working level. Only slab-type buildings allowed.	351 Bellevue is addressed by Administrative Order by Consent (VW-91-C-081 dated December 31, 1990) with the property owners - prohibits residential and commercial construction on the parcel. Environmental Covenant planned. 353 Bellevue is addressed by Environmental Covenant recorded with LaSalle County Recorder. Doc No. 2009-22484 on 9/2/2009 - prohibits excavation of soil below 491.25 feet and prohibits building construction unless radon reduction system is in place in certain areas.
	Groundwater	Prohibit use of groundwater.	City of Ottawa Ordinance Number 002-2007 (January 16, 2007). Environmental Covenant planned.
Illinois Power Building	Soil underneath building has not been tested and may be contaminated with radium-226. Indoor Air	No excavation under buildings or interference with foundation Radon Mitigation System.	Declaration of Environmental Restrictive Covenant was recorded with the LaSalle County Recorder (document no. 2008-20282) on September 9, 2008.

Status of ICs and Follow-up Actions Required

Institutional controls are required at NPL-1, 8, 9, 11, and Illinois Power Building.

Site-wide: The City of Ottawa has agreed to establish a repository for environmental covenants and develop procedures for notifying applicants for building permits of any activity and use restrictions necessary for the Ottawa Radiation Areas Site in accordance with the Consent Decree (1:10-cv-01887) for the Ottawa Radiation Site.

NPL-1: In the northwest corner of NPL-1, the contamination extends under Guion Street. In a Consent Decree (1:10-cv-01887) with the United States, the City of Ottawa has agreed to prohibit interference with the asphalt road and excavation of soils under the road unless the action is taken pursuant to a work plan approved by the EPA. The EPA will evaluate whether to include this institutional control in a decision document for NPL-1 after further investigation or upon completion of the remedy at the NPL-1 subarea. There is currently compliance with the restrictions on Guion Street.

NPL-9: Although the property at 613 West Marquette Street is located within the NPL-9 subarea, soil screening indicated that this address was not contaminated with radium; however soil contaminated with lead was found at this property and certain other properties located within NPL-9. In an Action Memorandum dated September 17, 2001, the EPA selected a response action to remove contaminated soils above lead cleanup levels to a depth not to exceed 4 feet at 613 West Marquette Street and other properties. Some areas of the 613 West Marquette Street exceed industrial/commercial cleanup standards below 4 feet. The landowners (at that time) recorded a restrictive covenant (document no. R2004-6385) that limits the use of the property to industrial/commercial use, prohibits residential use and prohibits disturbance of soil below 4 feet and "runs with the land." The IEMA and EPA may enforce the restrictions as third party beneficiaries. A commercial building was constructed on the property. No soil disturbances were observed during the FYR inspection. There is currently compliance with the restrictions on the property. The City of Ottawa has been notified of the land use restrictions in the Consent Decree.

Illinois Power Building: The soil beneath the Illinois Power Building was never evaluated, and the 2000 ROD requires radon monitoring, and if radon levels exceed permissible levels, then a radon reduction system will be operated in the building. The EPA entered into an administrative order on consent (AOC) with Illinois Power d/b/a AmerenIP (the owner at that time) whereby AmerenIP agreed to operate and maintain a radon reduction system in the Illinois Power Building and to prohibit any action to drill or intrude into, or demolish the building foundation. Furthermore, pursuant to the AOC, AmerenIP recorded a Declaration of Environmental Restrictive Covenant with the LaSalle County Recorder on September 9, 2008. The restrictive covenant included the following restrictions:

> No excavation under buildings: The extent of contamination, if any, associated with the soils underneath the foundations of the buildings has not been determined. No action shall be taken to drill or intrude into, or demolish the building foundations and no action

shall be taken to excavate soils under the buildings unless the owner conducts an extent of contamination study and removes all soils that exceed 6.2 pCi/g radium-226 pursuant to an IEMA approved work plan on the property.

Radon Mitigation System: The owner must operate and maintain a radon mitigation system in any buildings on the property to ensure that levels of radon do not exceed 4 pCi/L or other radon level the EPA determines is necessary to protect human health or the environment. The owner must conduct radon testing at the building at least every two years by an IEMA licensed measurement professional to ensure the mitigation system is working properly.

AmerenIP provided the EPA with a Chicago Title Insurance Company title commitment dated June 26, 2008 demonstrating AmerenIP's ownership of the property and recordation of the Environmental Restrictive Covenant on September 5, 2008 as document no. 2008-20282. The EPA and IEMA may enforce the restrictive covenant as third party beneficiaries. The City of Ottawa has been notified of the land use restrictions in the Consent Decree.

NPL- 11: The 2010 ROD Amendment requires implementation of environmental covenants (under the Illinois Uniform Environmental Covenants Act, 765 ILCS Ch. 122 (UECA)) that impose the following activity and use limitations on the site property:

- Prohibit excavation of soil at the site below an elevation of 491.25 feet in the area demarcated as the extent of contamination, unless conducted pursuant to an EPA- or Illinois EMA-approved work plan;
- Prohibit construction of any building in the area demarcated as the extent of contamination, unless a radon reduction system is operating and maintained to ensure that levels of radon in such buildings do not exceed 0.02 working level. Further, only slab-type buildings would be allowed;
- Require that material excavated from any portion of the site be tested and disposed of in accordance with applicable regulations; and
- Prohibit use of groundwater at the NPL-11 Site.

The owner of 353 Bellevue Avenue recorded a restrictive covenant (document no. 2009-22484) with the LaSalle County Recorder on September 2, 2009 that implements the required land use restrictions on this parcel. The owners of 351 Bellevue entered into an Administrative Order on Consent (VW-91-C-081 dated December 31, 1990) with the EPA whereby the owners agreed to prohibit residential and commercial construction on the parcel. The EPA will work with the owners to implement an environmental covenant under the Illinois UECA to implement the land use restrictions required by the ROD Amendment. The City of Ottawa has been notified of the land use restrictions required at NPL-11 under the Consent Decree.

The EPA is concurrently conducting an investigation of groundwater as required by the ROD Amendment. The City of Ottawa has an Ordinance Number 002-2007 (effective January 16, 2007), which prohibits the use of groundwater as a potable water supply by the installation or use of potable water supply wells within the City.

During the site inspection of NPL-11, the RPM did not observe any disturbance of the soil and the two properties remain vacant. There is no exposure to soil, radon, or groundwater at the two properties.

NPL-8 landfill: The 2000 ROD for the NPL-8 landfill requires land use restrictions that prohibit interference with the 10 foot cover (when completed), and all uses except recreational use and structures with slab on grade with appropriate controls for radon gas. The State of Illinois owns the property and in comments on the 2000 ROD stated that it intends to limit future use of the property to recreational use and will be responsible for enforcing the restrictions. The remedy has not yet been initiated for the NPL-8 landfill property. The property is currently fenced and unused. The City of Ottawa has been notified of the necessary land use restrictions on NPL-8 in the Consent Decree.

NPL-8 Frontage Property: The 2003 ROD for the NPL-8 Frontage Property requires land use restrictions via a restrictive covenant to: a) restrict future use of the property to commercial/ industrial; b) prohibit disturbance of the 10-foot cover; c) require radon reduction system and monitoring on any buildings constructed on a portion of the property in the future; and d) limit construction to only slab on grade buildings. The remedy has not yet been initiated for the NPL-8 Frontage Property. The current owners and the City of Ottawa have been notified of these necessary land use restrictions in the Consent Decree.

Long-Term Stewardship:

Long-term protectiveness at the Site requires compliance with effective ICs to ensure that the remedy continues to function as intended. To assure proper maintenance, monitoring, and enforcement of effective ICs, long-term stewardship procedures will be reviewed and a plan developed.

The EPA has entered into a Consent Decree with the City of Ottawa, whereby the City has agreed to prepare and implement a government plan that will include: a) establishment of a repository for property agreements and environmental covenants related to the Site; and b) procedures for notifying applicants of City building and construction permits of activity and use restrictions at the Site. The EPA will request that the City submit a draft government plan to the EPA for review and approval under the Consent Decree. These elements will be contained in the IC plan.

Additionally, development of a communications plan and registering subareas where radium-contamination remains in place with the state's one call program will be explored for long-term stewardship.

The EPA will work with the City of Ottawa and IEMA to develop an IC plan for the Site. The IC plan will not be finalized until site-wide construction completion, thus a deadline for the IC plan is not included in this FYR.

V. Progress Since the Last Review

This is the first five-year review for the site.

VI. Five-Year Review Process

Administrative Components

The IEMA and IL EPA were notified of the initiation of the five-year review on July 15, 2010. The Ottawa Radiation Areas Site five-year review was conducted by Denise Boone of the EPA. The review, which began on July 13, 2010, consisted of the following components:

- Community Involvement;
- Document Review;
- Data Review;
- Site Inspection; and
- Five-Year Review Report Development and Review.

Community Involvement

Activities to involve the community in the five-year review were initiated on July 13, 2010 by the RPM. A notice was sent to a local newspaper that a five-year review was to be conducted. The notice was published in the Daily Times Newspaper in Ottawa, Illinois on September 29, 2010. The notice invited the public to submit any comments to the EPA (see Attachment 1). The results of the review and the report will be made available at the site information repository located at the Reddick Library, 1010 Canal Street, Ottawa, Illinois. No comments were received during this review.

Document Review

This five-year review consisted of a review of relevant documents (see Attachment 2).

Data Review

The following issues were noted during the data review:

NPL-1

Contamination may be under the Marquette High School Athletic Field locker room/storage building, therefore a further soil investigation is needed and contamination must be addressed if necessary.

Illinois Power Building

The EPA will verify the status of the radon migration system with the property owner. Additionally, the EPA will verify that the property owner has conducted the required radon testing of the building. A Declaration of Environmental Restrictive Covenant was recorded with the LaSalle County Recorder on September 9, 2008. The 2000 ROD required land use restrictions on the Illinois Power Building but did not specify the type of institutional control to implement the land use restrictions. The ROD will be clarified to identify the implemented restrictive covenant.

Site-wide

As part of the long-term stewardship, the EPA will develop an IC plan, which will include exploring registering subareas where radium contamination will remain in place with the state's one call program.

Site Inspection

A site inspection was conducted on April 8, 2011 by Denise Boone, EPA RPM. The purpose of the inspection was to assess the protectiveness of the remedies at NPL- 9, 11, Illinois Power Building, and Luminous Processes, Inc. Adjacent subareas where the soil excavation activities have been completed. Additionally, inspections were conducted at NPL-1, 4, and 8 subareas where the remedies have not been completed or started.

There have been no physical condition or land use changes at the NPL-1, 4, 8, 9, 11, Illinois Power Building, and Luminous Processes, Inc. Adjacent subareas. The fences at NPL-4 and 8 are in good condition and there is no evidence of trespassing. At the NPL-9 lead-contaminated soil removal property, a commercial building has been constructed, however, no other soil disturbances were observed.

During the site inspection, the RPM did not observe any disturbance to the Illinois Power Building foundation. However, the RPM could not determine if the radon mitigation system was operational. The EPA will verify the status of the radon mitigation system with the property owner. Additionally, the EPA will verify that the property owner has conducted the required radon testing of the building.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The remedy is expected to function as intended once site-wide construction completion is achieved. The remedies at three subareas have been completely implemented and they are functioning as intended. They include the excavation and disposal of radium-contaminated soil at the NPL-9, Illinois Power Building, and Luminous Processes, Inc. Adjacent subareas.

NPL-11 remains vacant and no disturbance of soil was observed. An environmental covenant implements land use restrictions on one parcel, and an AOC implements land use restrictions on the other parcel of NPL-11. The EPA will work with the current owner to ensure that environmental covenants are implemented on both parcels. The EPA is conducting an investigation of groundwater to determine the extent of contamination at NPL-11. There is no other information that calls into question the protectiveness of remedies at these four subareas.

The Illinois Power Building is subject to a restrictive covenant requiring use of radon mitigation system; however the EPA was unable to confirm use of the system.

The following remedies have yet to be fully implemented, however, once implemented the remedies are expected to function as intended:

- NPL-1: Excavate remaining soil contamination. Investigate whether there is soil contamination under the Marquette High School locker room/storage building and address;
- NPL-4: Implement excavation and disposal remedy; and
- NPL-8: Implement excavation and disposal remedy and institutional controls.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selections are still valid. There has been no change in expected land use at or near the subareas. Human health exposure routes or receptors have not changed since the remedy selections. There are no newly identified contaminations or unanticipated toxic byproducts based on current information. Toxicity information and current risk assessment methodologies have not changed so as to affect the protectiveness determination.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No, there is no information that calls into question the protectiveness of the selected remedies once they are completely implemented.

Technical Assessment Summary

According to the data reviewed and the site inspection, the remedies at NPL-9, NPL-11, Illinois Power Building, and Luminous Processes, Inc. Adjacent subareas are functioning as intended by the decision documents. There have been no changes in the physical conditions of the subareas that would affect the protectiveness of the remedy. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the completed remedies.

VIII. Issues

Table 2: Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
NPL-1: soil contamination may extend under the Marquette High School locker room/storage building.	N	Y
NPL-11: an environmental covenant is not in place on one of the parcels, as required by the ROD Amendment.	N	Y
Illinois Power Building: the radon reduction system may not be operational and radon testing of the building may not have been conducted as required by the restrictive covenant.	N	Y
Overall protectiveness may be improved by registration of areas where radium-226 contaminated soil will remain in place with the state one call program.	N	Y

IX. Recommendations and Follow-Up Actions

Table 3: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Possibility of additional soil contamination	NPL-1: investigate soil contamination underneath Marquette High School locker room/storage facility and address if necessary.	EPA	EPA	November 2012	N	Y
ICs	NPL-11: implement environmental covenant on remaining parcel.	EPA	EPA	April 2013	N	Y

Table 3: Recommendations and Follow-up Actions						
Issue	**Recommendations and Follow-up Actions**	**Party Responsible**	**Oversight Agency**	**Milestone Date**	**Affects Protectiveness (Y/N)**	
					Current	**Future**
ICs	Illinois Power Building: verify that the radon reduction system is operational and verify that radon testing has been conducted.	EPA	EPA	December 2012	N	Y
ICs	Improve long-term stewardship by exploring registering areas where radium-226 contaminated soil will remain in place with state one call program.	EPA	EPA	April 2013	N	Y

The 2000 ROD required land use restrictions on the Illinois Power Building; however the ROD did not specify the type of institutional control to implement the land use restrictions. An ESD will be developed to identify the implemented restrictive covenant.

X. Protectiveness Statement

Construction of the remedies for the Ottawa Radiation Areas Site has not been completed, and the Site has not yet reached construction completion. The status and protectiveness determinations are summarized for each operable unit/subarea of the Site below:

Operable Unit #1 (NPL-8 landfill):

NPL-8 landfill: The EPA selected the remedy for the NPL-8 landfill in a Record of Decision dated September 8, 2000 (2000 ROD), which includes excavation of soil down to a depth of 10 feet below ground surface (bgs), off-site disposal of soil, backfilling and institutional controls. Institutional controls (ICs) will be needed to prohibit disturbance of the 10 foot soil cover, prohibit construction of buildings with basements, and require a radon reduction system for any buildings (without basements). The remedial actions have not yet begun at the NPL-8 landfill; therefore, this area cannot be evaluated for

protectiveness as part of this FYR. A protectiveness determination is therefore not provided for Operable Unit #1 in this FYR.

Operable Unit #2 (NPL-1, 4, 9, 11 and Illinois Power Building):

Overall, the protectiveness determination for Operable Unit #2 cannot be made at this time because the remedies at NPL-1 and NPL-4 have not been completed. A protectiveness determination for Operable Unit #2 will be made once the EPA completes the remedies at NPL-1 and NPL-4 subareas. In the interim, there are currently no known complete exposure pathways and therefore there are no unacceptable risks present at the Operable Unit #2 subareas. Below is a discussion of each of the subareas of Operable Unit #2:

NPL-1: The EPA selected a remedy for NPL-1 in the 2000 ROD, which requires excavation and disposal of all contaminated soil above the 6.2 pCi/g radium-226 cleanup standard. The remedy at NPL-1 is expected to be protective of human health and the environment upon completion of the excavation remedy and in the interim, exposure pathways that could result in unacceptable risks are being controlled. Radon sampling of the nearby Marquette High School locker room/storage facility has shown that levels of radon are below the action level of 4.0 pico curies/liter (pCi/l). Additional soil sampling of this area will be conducted.

NPL-4: The EPA selected a remedy for NPL-4 in the 2000 ROD, which requires excavation and disposal of all contaminated soil above the 6.2 pCi/g radium-226 cleanup standard. Remedial actions have not yet begun at NPL-4; therefore, this area cannot be evaluated for protectiveness as part of this FYR.

NPL-9: The EPA selected a remedy for NPL-9 in the 2000 ROD, which requires excavation and disposal of all contaminated soil above the 6.2 pCi/g radium-226 cleanup standard. The remedy at NPL-9 has been implemented and is protective of human health and the environment.

NPL-11: For subarea NPL-11, the remedy is set forth in a 2003 ROD as amended by a ROD Amendment dated August 16, 2010. At NPL-11, the EPA has removed contaminated soil down to an elevation of 491.25 feet. The ROD Amendment addresses contaminated soil below an elevation of 491.25 feet by requiring the implementation of environmental covenants that prohibit: a) excavation below an elevation of 491.25 feet; b) buildings without radon reduction systems; and c) groundwater use. The remedy at NPL-11 is currently protective of human health and the environment because the existing use (empty field) is consistent with the land use restrictions. Long-term protectiveness requires the implementation of an environmental covenant and compliance with land use restrictions at NPL-11.

Illinois Power Building: The EPA selected the remedy for the Illinois Power Building subarea in the 2000 ROD, which includes soil excavation and off-site disposal of soil contaminated with radium-226 above 6.2 pCi/g; backfill of excavated areas with clean material; and, if radon levels persist in the Illinois Power Building, a operation of radon

reduction system. The EPA has implemented the remedy at the Illinois Power subarea, and the remedy is protective of human health and the environment because radium-contaminated soil has been excavated to meet the 6.2 pCi/g cleanup level and ICs have been implemented. However, the EPA must verify that the radon reduction system is operational, and that radon testing has been conducted by the property owner.

Operable Unit #3 (Lead-Contaminated Soil Removal Action):

In an Action Memorandum dated September 17, 2001, the EPA selected a response action to remove contaminated soils above lead cleanup levels to a depth not to exceed 4 feet at 613 West Marquette Street and certain other properties. Although the property at 613 West Marquette Street is located within the NPL-9 subarea, soil screening indicated that this address was not contaminated with radium; however, soil contaminated with lead was found at this property and certain other properties located within NPL-9. After implementation of the removal action, sampling revealed some areas at 613 West Marquette Street exceed industrial/commercial cleanup standards below 4 feet. The former landowners recorded a restrictive covenant that limits the use of the property to industrial/commercial use, prohibits residential use and prohibits disturbance of soil below 4 feet. The remedy at this property is currently protective of human health and the environment because the existing use is consistent with the land use restrictions. Long-term protectiveness requires compliance with institutional controls on the property.

Operable Unit #4 (NPL-8 Frontage Property):

NPL-8 Frontage Property: The EPA selected a remedy for the NPL-8 Frontage Property in the 2003 ROD, which requires excavation of soil down to a depth of 10 feet bgs, off-site disposal of soil, backfilling, and institutional controls. The 2003 ROD requires restrictive covenants to prohibit disturbance of the 10 foot soil cover, prohibit construction of buildings with basements, and require a radon reduction system for any buildings (without basements). The remedial action has not yet begun at NPL-8 Frontage Property; therefore, this area cannot be evaluated for protectiveness as part of this FYR. A protectiveness determination is therefore not provided for Operable Unit #4 in this FYR.

Operable Unit #5 (Luminous Processes, Inc. Adjacent):

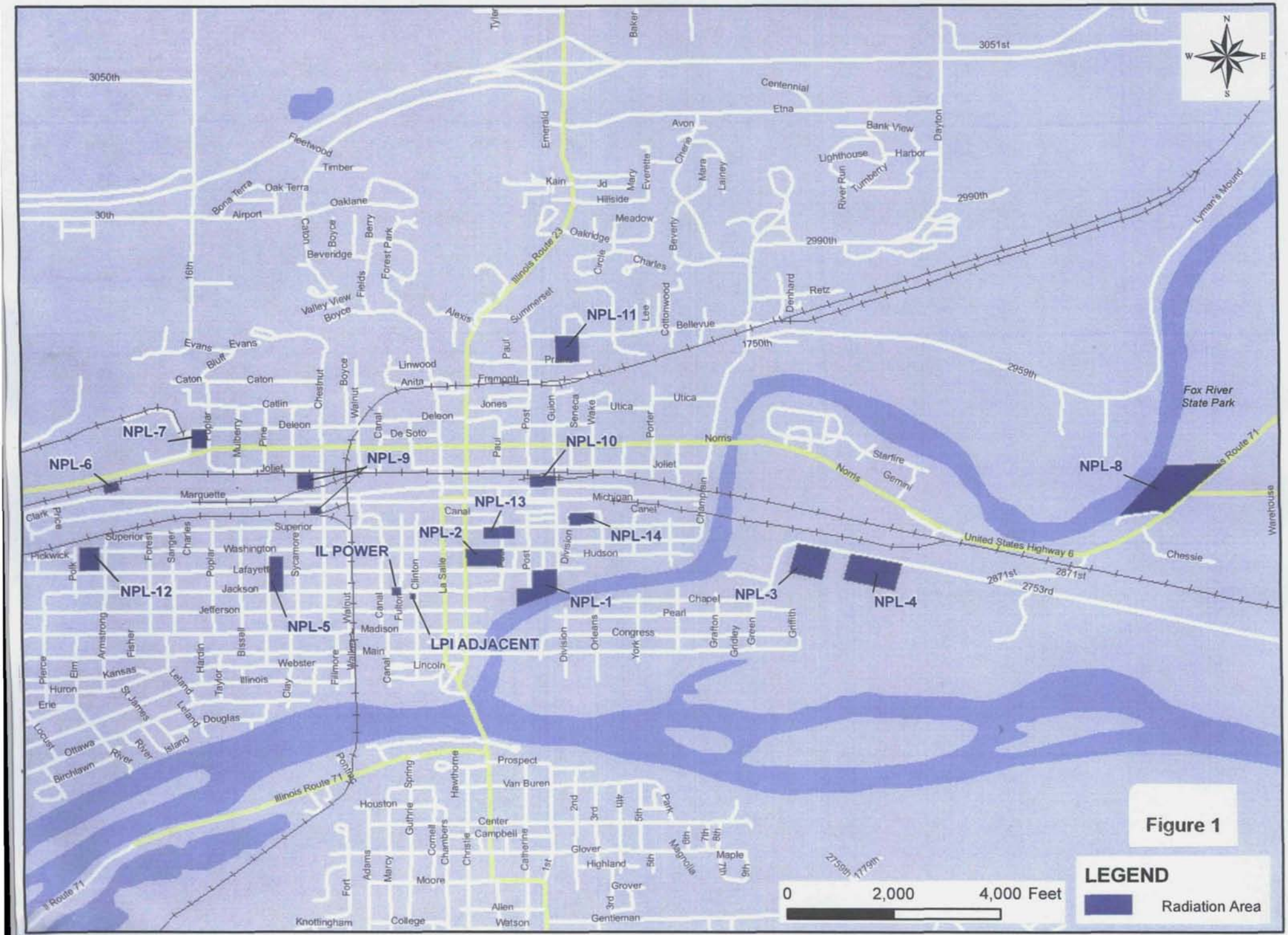
Luminous Processes, Inc. (LPI) Adjacent: The EPA selected a remedy for the LPI Adjacent property in an Explanation of Significant Differences (ESD) dated March 21, 2007, which modified the 2003 ROD. The ESD required excavation and off-site disposal of soil contaminated with radium-226 above 6.2 pCi/g at the LPI Adjacent property. EPA has implemented the remedy at LPI Adjacent, which is protective of human health and the environment because radium-contaminated soil has been excavated to meet the 6.2 pCi/g cleanup level.

XI. Next Review

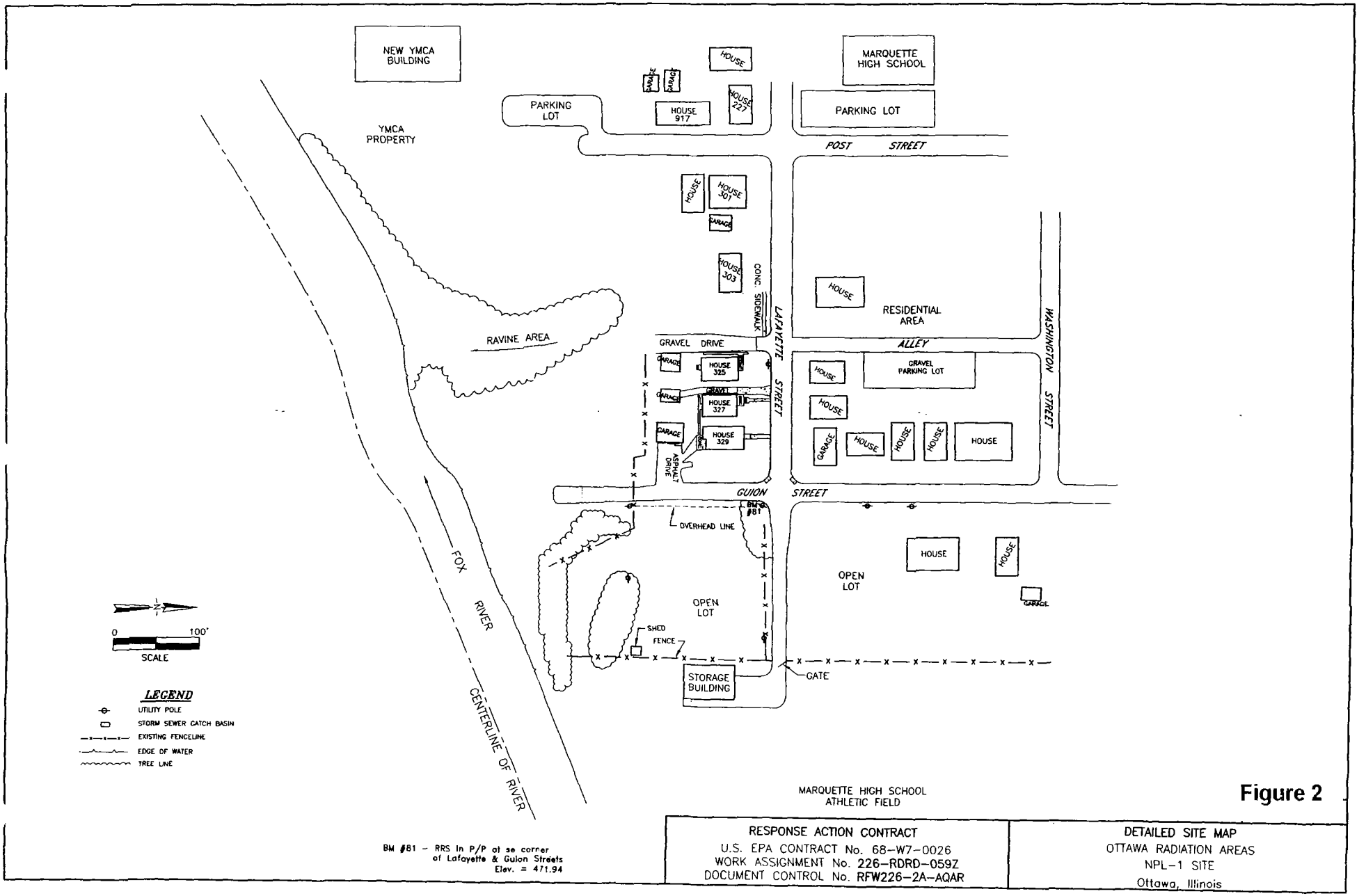
The next five-year review for the Ottawa Radiation Areas Site is required no less than five years from the signature date of this review.

Figures

OTTAWA RADIATION AREAS LOCATION MAP



SOURCE: TIGER FILES 2000.



BM #81 – RRS In P/P at se corner of Lafayette & Guion Streets
Elev. = 471.94

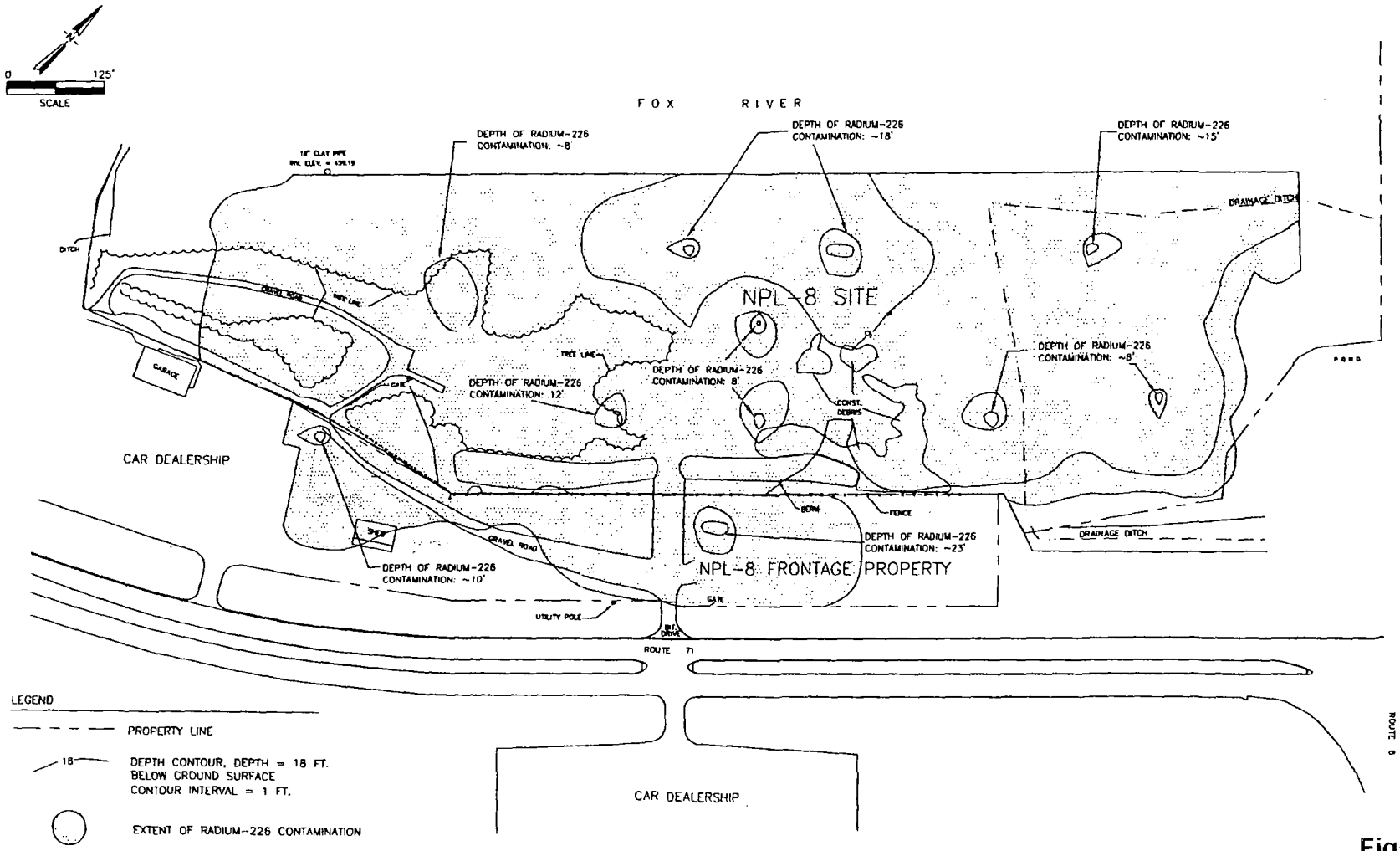
Figure 2

RESPONSE ACTION CONTRACT	DETAILED SITE MAP
U.S. EPA CONTRACT No. 68-W7-0026 WORK ASSIGNMENT No. 226-RDRD-059Z DOCUMENT CONTROL No. RFW226-2A-AQAR	OTTAWA RADIATION AREAS NPL-1 SITE Ottawa, Illinois

Figure 3

RESPONSE ACTION CONTRACT
U.S. EPA CONTRACT No. 68-W7-0026
WORK ASSIGNMENT No. 226-RDRD-059Z
DOCUMENT CONTROL No. RFW226-2A-AQAR

DETAILED SITE MAP
OTTAWA RADIATION AREAS
NPL-4 SITE
Ottawa, Illinois



K:\1179&1516\OTTAWA\EPA Drawings\FIGURE 1 NPL8.dwg

Figure 4

RESPONSE ACTION CONTRACT U.S. EPA CONTRACT No. 68-W7-0026 WORK ASSIGNMENT No. 150-RDRD-059Z DOCUMENT CONTROL No. RFW150-2A-AMTV	EXTENT OF RADIUM-226 CONTAMINATION NPL-8 AND NPL-8 FRONTAGE PROPERTY Ottawa, Illinois

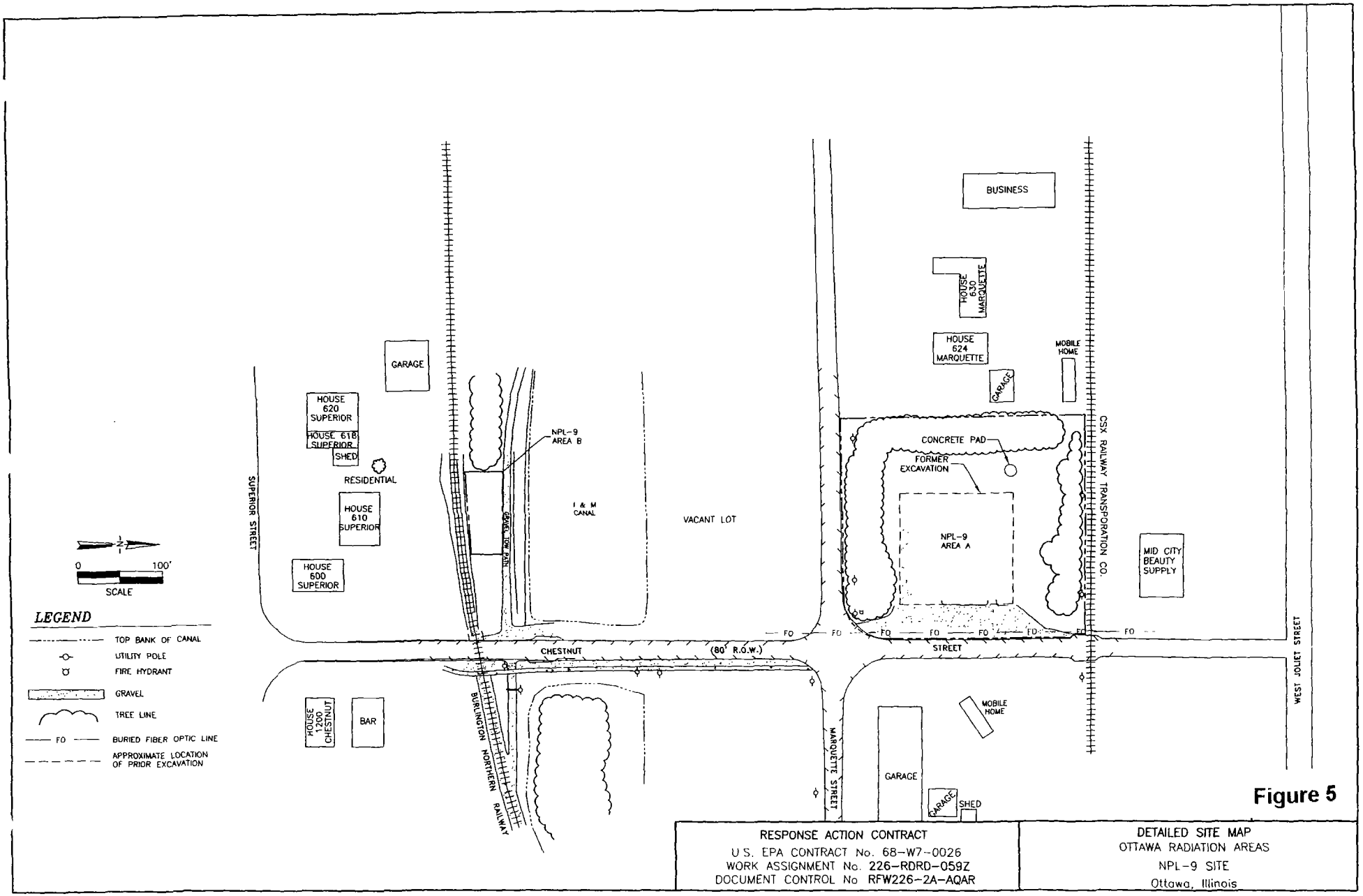


Figure 5

RESPONSE ACTION CONTRACT
U.S. EPA CONTRACT No. 68-W7-0026
WORK ASSIGNMENT No. 226-RDRD-059Z
DOCUMENT CONTROL No RFW226-2A-AQAR

DETAILED SITE MAP
OTTAWA RADIATION AREAS
NPL-9 SITE
Ottawa, Illinois

Figure 6

LEGEND

SITE BOUNDARY

N

0 60'

SCALE

RESPONSE ACTION CONTRACT
U.S. EPA CONTRACT No. 68-W7-0026
WORK ASSIGNMENT No. 226-RDRD-059Z
DOCUMENT CONTROL No. RFW226-2A-AQAR

DETAILED SITE MAP
OTTAWA RADIATION AREAS
NPL-11 SITE
Ottawa, Illinois

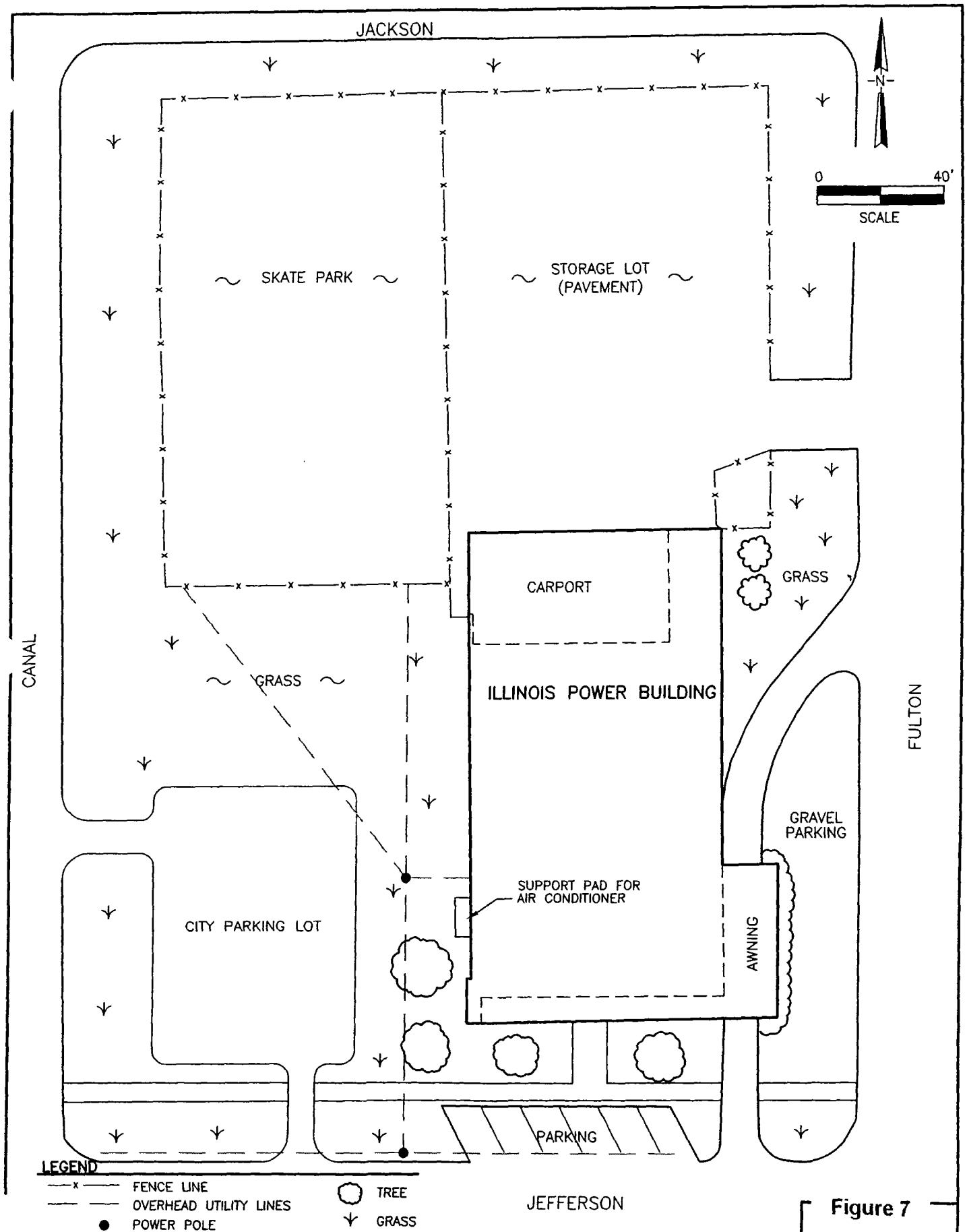


Figure 7

RESPONSE ACTION CONTRACT U.S. EPA CONTRACT No. 68-W7-0026 WORK ASSIGNMENT No. **226-RDRD-059Z** DOCUMENT CONTROL No. **RFW226-2A-AQAR**	DETAILED SITE MAP OTTAWA RADIATION AREAS ILLINOIS POWER SITE Ottawa, Illinois

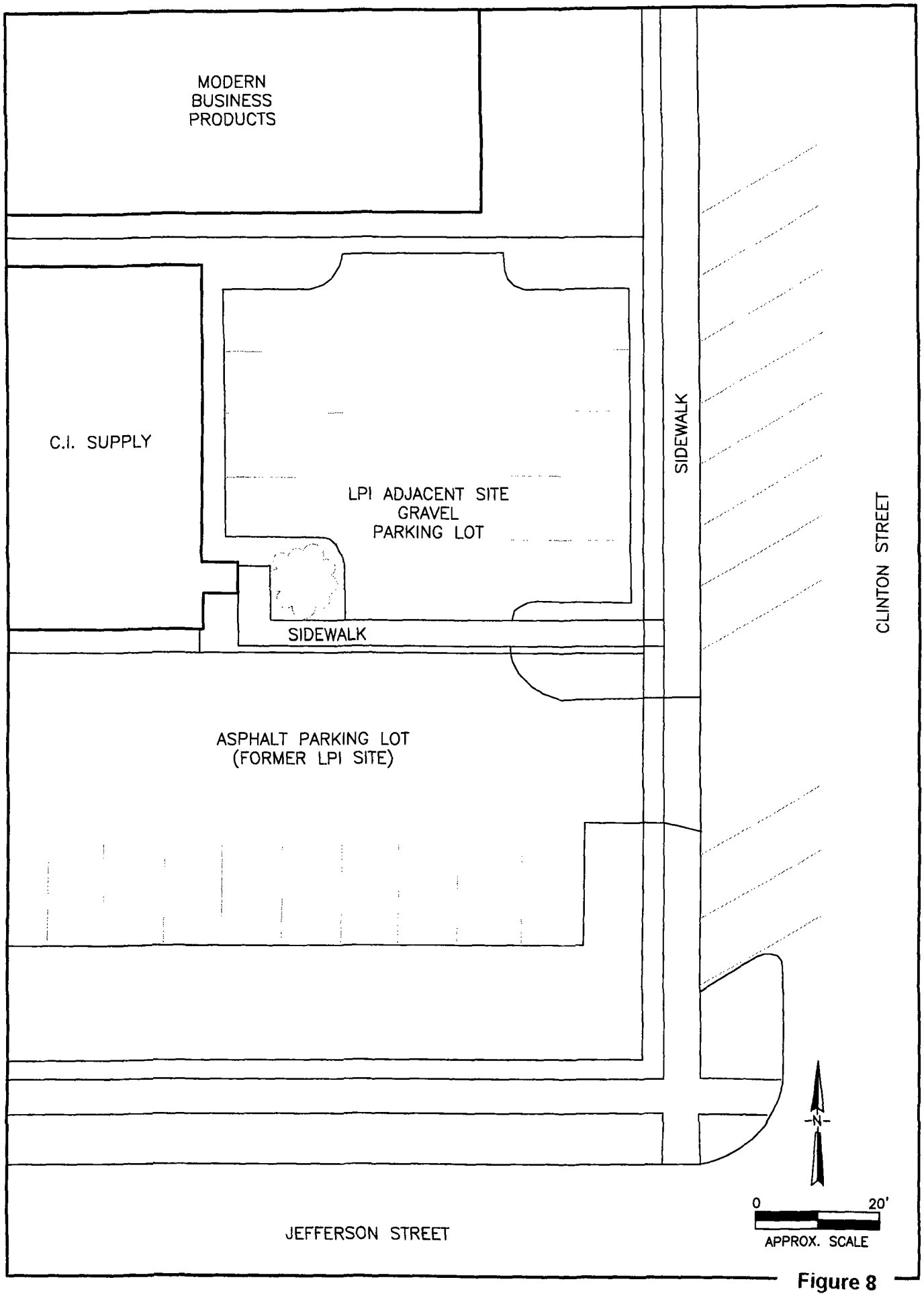


Figure 8

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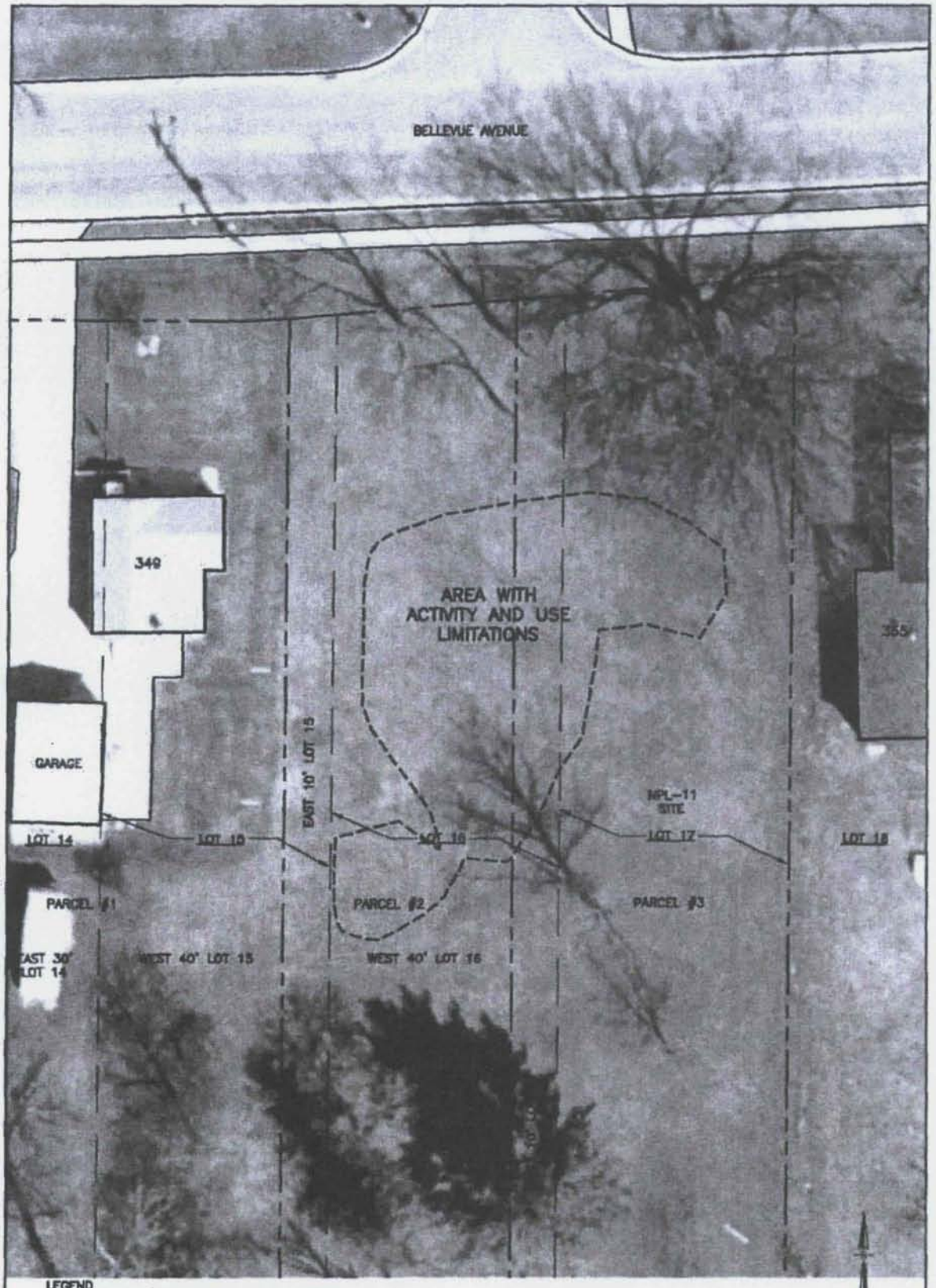

Figure 9

Prepared For: U.S. EPA, REGION V Contract No: EP-S5-06-04 TDD NO: S05-0008-0802-008 DCN: 385-2A-AGHB	Prepared By: WESTON SOLUTIONS, INC. 20 N. Wacker Drive Suite 1210 Chicago, Illinois 60606	Alternative 4 Conceptual Site Layout OTTAWA RADIATION AREAS NPL-11 SITE Ottawa, Illinois

J:\CAD\93\0001\061104.dwg, 3/11/2010 8:49:12 AM

Attachment 1
Public Outreach by EPA for Five-Year Review

THE DAVID GROUP

Invoice Number:	114320
Order Number:	324387
Client Name:	Tetra Tech EM Inc.
Ad:	Ottawa Radiation FYR
Publication:	Daily Times
Run dates:	Sep 29 2010

EPA Begins Review of Ottawa Radiation Areas Superfund Site

Ottawa, Illinois

U.S. Environmental Protection Agency is conducting a five-year review of the Ottawa Radiation Area Superfund site, Ottawa, Ill. The Superfund law requires regular checkups of sites that have been cleaned up - with waste managed on-site - to make sure the cleanup continues to protect people and the environment.

The Ottawa Radiation Area consists of 16 radium-contaminated subareas. EPA removed contaminated soil in many of these subareas. Seven subareas (NPL-1, 4, 8, 9, 11, Illinois Power and Luminous Processes Inc. (LPI) Adjacent) were investigated under the remedial program.

EPA completed cleanup actions at NPL-9, Illinois Power and LPI Adjacent which included:

- Excavated soil contaminated with radium-226 above 6.2 pCi/g.
- Backfilled excavated areas with clean material.
- Disposed of the excavated contaminated material at a licensed radioactive material or off-site landfill in accordance with applicable federal and/or state regulations.
- Collected perched water (if necessary), treated and discharged to surface water or discharged to the City of Ottawa's wastewater treatment system.

EPA issued a final cleanup plan for NPL-11 on August 16, 2010 which includes:

- Prohibiting anyone to dig up soil below the ground water table unless approved by EPA or the Illinois Emergency Management Agency.
- Prohibiting construction of any buildings without a radon reduction system.
- Prohibiting the use of ground water for drinking.
- Testing and moving any material from the site to the appropriate disposal landfill.

EPA is planning to complete the cleanup at NPL-1 and start cleanup actions at NPL-4 and NPL-8 in the future depending on funding.

More information is available at the Reddick Library, 1010 Canal St., Ottawa, and at www.epa.gov/region5/sites/ottawa.

The five-year review is an opportunity for you to tell EPA about site conditions and any concerns you have. Contact:

Cheryl Allen
Community Involvement Coordinator
312-353-6196
allen.cheryl@epa.gov

Denise Boone
Remedial Project Manager
312-886-6217
boone.denise@epa.gov

You may call Region 5 toll-free at 800-621-8431, 8:30 a.m. to 4:30 p.m., weekdays.

EPA Region 5
77 W. Jackson Blvd.
Chicago, IL 60604

Attachment 2
Documents Reviewed

Ottawa Radiation Area Site
Documents Reviewed

1. Treatability Study Evaluation Report For Ottawa Radiation Areas, NPL-4 Site Ottawa, Illinois, Weston Solutions, March 2004
2. Treatability Study Evaluation Report For Ottawa Radiation Areas, NPL-8 Site Ottawa Illinois, Weston Solutions, March 2004
3. Technical Memorandum (Focused Remedial Investigation/Feasibility Study), Ottawa Radiation Areas, Luminous Processes Inc. Adjacent Site, Ottawa, Illinois, Weston Solutions, Inc., January 2007
4. Ordinance No. 002-2007, An Ordinance Prohibiting the Use of Groundwater as a Potable Water Supply by the Installation or Use or Potable Water Supply Wells or by any Other Method Within the City of Ottawa, January 2007.
5. NPL-11 Site, Feasibility Study Report, Weston, March 2010
6. NPL-1, 9, 11, and Illinois Site, Remedial Action Report, Weston, October 2007
7. Luminous Processes. Inc. Adjacent Site (Operable Unit 5), Remedial Action Report, Sultrac, January 2010
8. Pre-Design Investigation Report for the Ottawa Radiation Sites NPL-1 and NPL-9, Roy F. Weston, Inc., September 2001
9. ROD for NPL-1, 4, 8, 9, and Illinois Power Building, September 8, 2000
10. ROD for NPL-11 and NPL-8 Frontage Property, September 24, 2003
11. Explanation of Significant Differences for Luminous Processes, Inc. Adjacent, March 21, 2007
12. ROD Amendment for NPL-11, August16, 2010